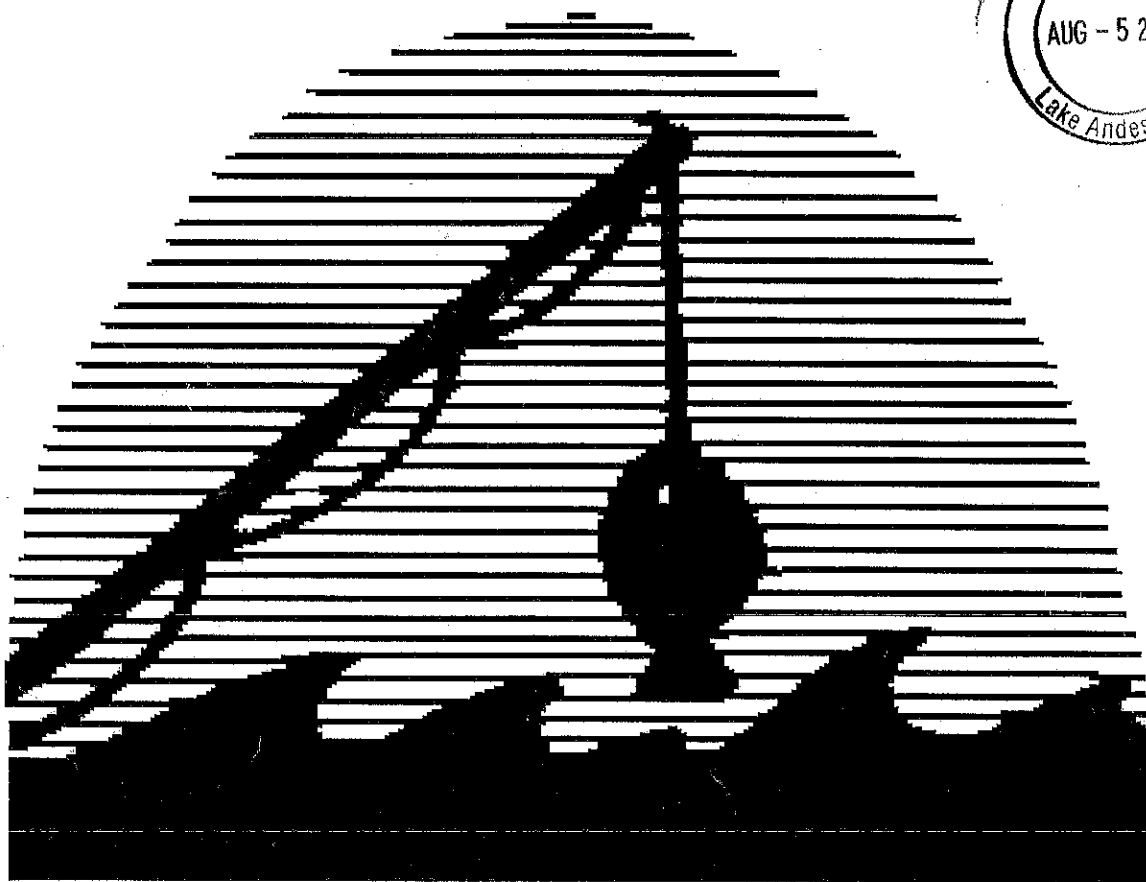
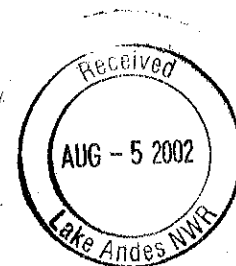


FISH POPULATION INVESTIGATION

LAKE ANDES CHARLES MIX COUNTY MAY, 2002



SOUTH DAKOTA
DEPARTMENT OF GAME, FISH & PARKS
(WILDLIFE DIVISION, REGION II)

Completed by Dan R. Jost, Regional Fisheries Manager

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INTRODUCTION

Lake Andes is located in southeastern South Dakota near the town of Lake Andes and encompassed by the Lake Andes National Wildlife Refuge. The Refuge is managed primarily for waterfowl production. The water source for the lake is mainly runoff from an 84,000-acre watershed. The main inflow is from Andes Creek, which terminates at the north end of the lake, with additional water entering the south unit via Owens Bay. The watershed consists of primarily agricultural cropland, interspersed with native grasslands. Rainfall averages 55 cm per year, while evaporation averages 96 cm per year. Depending on annual precipitation, Lake Andes fluctuates from practically dry to completely full. Since 1922, Lake Andes has been essentially dry on an average of once every eleven years. The fluctuating water levels are detrimental to most game fish species, but less harmful to undesirable species. Due to this fact, carp and bullhead dominate the fish population resulting in very turbid water conditions preventing the growth of submergent aquatic vegetation.

Historically, Lake Andes was a much larger body of water. In 1922 Congress authorized the construction of an outlet structure which when completed established a high water elevation of 1437.24 feet above sea level, effectively lowering the lake water level by 13 feet. Presently, at full pool, Lake Andes is approximately 4,180 surface acres, with an average depth of 3-4 feet. Two county roads divide the lake into three units. The North Unit is approximately 680 surface acres with a maximum depth of 10 feet, the Center Unit is about 1,900 surface acres with a maximum depth of 11 feet, and the South Unit consists of approximately 1,600 surface acres with a maximum depth of 11 feet.

Lake Andes has a long history of recreational fishing. The first recorded fish stocking took place in the early 1900's and a "renowned" largemouth bass fishery developed. Since that time, reduced lake levels, sedimentation, and eutrophication have all contributed to the decline of the fishery. The lake was last renovated in 1958 and restocked in 1959. After ample rainfall in 1962, the lake provided a quality fishery until winterkill in 1964. Since that time several stockings have taken place but a satisfactory fishery has not developed other than during short periods when high water levels were sustained for several years.

Lake Andes can at best be considered a "boom and bust" fishery with short periods of good fishing during high water levels followed by declining fishing until a major fish kill occurs. Unfortunately, most fishermen only remember the "boom" years and would like the fishery maintained as such. During the winter of 2001 a major fish kill occurred greatly reducing the number of all fish species. Netting efforts the following spring revealed a remnant population of carp and bullhead that had either survived in the lake or entered via the watershed during the spring's runoff. The lake was stocked with northern pike fry and prespawn yellow perch in 2001 to reintroduce game fish and hopefully establish a fishery.

METHODS

Lake Andes' fish population was sampled on May 21 – 23, 2002 to determine the status of all fish species and to evaluate the success of northern pike and yellow perch stocking efforts. The lake investigation was requested by Refuge staff to provide information for future lake management decisions regarding the manipulation of water levels in favor of waterfowl production and vegetation growth. A total of six, ¾-inch mesh, 3X5-foot frame nets and two, 150-foot experimental gill nets were set in the south and center units of Lake Andes on May 21. The nets were ran and reset on May 22, and ran and pulled on May 23. A representative sample of each species captured was weighed and measured. All game fish were individually counted. Due to excessive numbers, rough fish (carp and bullhead) were sample counted and fish/gallon was used to determine total number. The vast majority of fish sampled were juvenile (one-year-old), so age and growth information was not collected or analyzed. Since juvenile fish are below stock length, stock density indices (PSD and RSD), and condition factors (Wr) were not calculated.

RESULTS

Black Bullhead

Black bullhead was the most abundantly sampled fish species in Lake Andes during the 2002 lake investigation. Frame net CPUE for bullhead in the South Unit was 578.8 while the Center Unit CPUE was a more manageable 51.1. Length frequencies for both units were similar with the majority of fish being under 150 mm (attached length frequency table).

Table 1. BLACK BULLHEAD CPUE – LAKE ANDES, MAY, 2002

Net #	1	2	3	4	5	6	Total	CPUE
South Unit								
Trap Net	82	24	975	874	506	1012	3473	578.8
Gill Net	0	0					0	0
Center Unit								
Trap Net	5	26	124	69	5	77	306	51.1
Gill Net	0	5					5	2.5

Common Carp

Common carp were the second most abundant species sampled at Lake Andes. Like bullhead, yearling fish dominated the population with all carp measured being less than 350 mm (attached length frequency graph). Carp were most abundant in the South Unit with a frame net CPUE of 155.5 and a gill net CPUE of 35.5. The Center Unit's CPUEs were 5.5 and 29 respectively. The only adult carp observed were in the South Unit.

Table 2. COMMON CARP CPUE – LAKE ANDES, MAY, 2002

Net #	1	2	3	4	5	6	Total	CPUE
South Unit								
Trap Net	75	12	274	209	121	242	933	155.5
Gill Net	24	47					71	35.5
Center Unit								
Trap Net	4	4	13	7	5	0	33	5.5
Gill Net	34	24					58	29

Northern Pike

Following the winterkill of 2001, 2 million northern pike fry were stocked in Lake Andes to reestablish the species and provide a predator to help control rough fish. During the 2002 lake investigation, yearling northern pike were sampled indicating successful recruitment from the 2001 fry stocking. Northern pike ranged from 450 mm to 550 mm, growth was above the state average (attached length frequency graph). One northern pike greater than one-year-old was also sampled.

Table 3. NORTHERN PIKE CPUE – LAKE ANDES, MAY, 2002

Net #	1	2	3	4	5	6	Total	CPUE
South Unit								
Trap Net	2	1	1	2	1	0	7	1.2
Gill Net	3	1					4	2
Center Unit								
Trap Net	5	3	4	3	2	2	19	3.17
Gill Net	1	8					9	4.5

Yellow Perch

Eight hundred pre-spawn yellow perch were also stocked into Lake Andes in April of 2001. Twenty-two perch were sampled during the May 2002 netting. Of the perch, two were adult and the remaining 20 were juvenile. The pre-spawn adults stocked in 2001 had successfully reproduced and created a year-class of fish that were between 130 mm and 190 mm at age one (attached length frequency graph).

Table 3. YELLOW PERCH CPUE – LAKE ANDES, MAY, 2002

Net #	1	2	3	4	5	6	Total	CPUE
South Unit								
Trap Net	1	0	2	5	0	2	10	1.7
Gill Net	6	0					6	3
Center Unit								
Trap Net	0	1	0	0	0	2	3	0.5
Gill Net	3	0					3	1.5

DISCUSSION

Management of Lake Andes should be representative of a marginal fishery. Lake water levels are the limiting factor in fisheries management. During periods of high water, low oxygen tolerant game fish species, such as northern pike and yellow perch, can, and do, produce a short-term fishery. When water levels recede, Lake Andes is unable to support fish life. Historical records indicate that fluctuating water levels will not allow a long-term fishery to develop with current lake conditions. Except when the lake is at full-pool, and remains that way for an extended period of time, it is extremely difficult to manage as a fishery.

Due to their ability to withstand low water levels and depleted dissolved oxygen supplies, rough fish (carp and bullhead) will continue to dominate the fish community. Even after a severe fish kill, the unrestricted movement of fish from the watershed, through all three units of the lake, allows rough fish to quickly reestablish their population. Without the installation of a structural barrier to restrict rough fish movement from all or at least one section of the lake, it is nearly impossible to establish a predator population that can successfully limit recruitment.

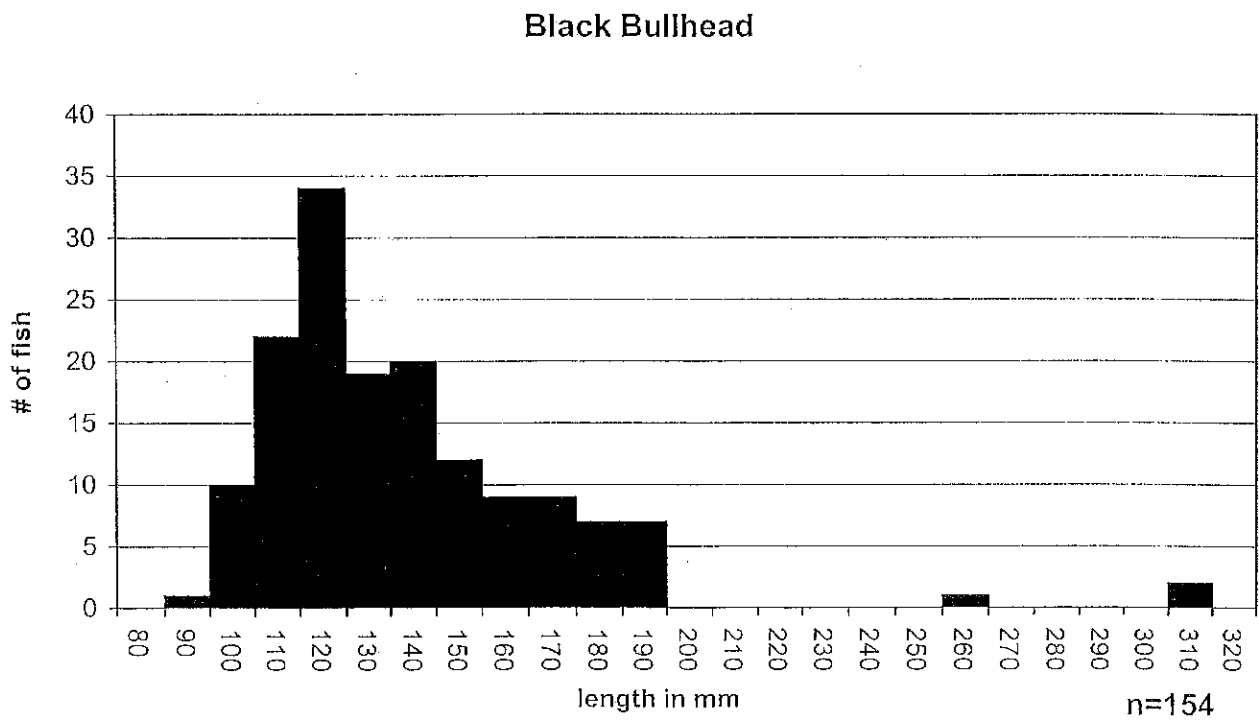
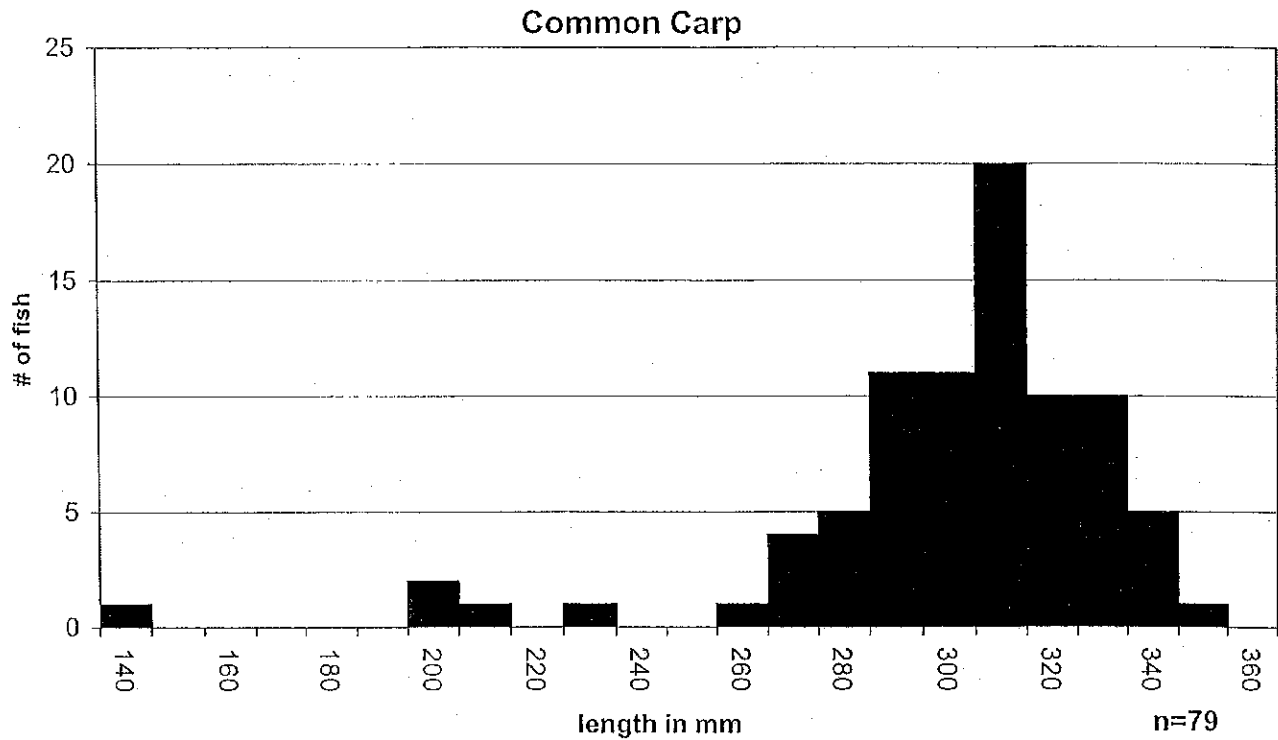
RECOMMENDATIONS

1. Continue to manage as a marginal northern pike and yellow perch fishery by stocking northern pike fry and yellow perch adults when water levels are at full pool.
2. Investigate the potential of utilizing a rotating screen or other type of fish barrier to restrict the movement of rough fish to the Center and South Units of Lake Andes. By controlling the number of rough fish, water clarity would improve promoting the growth of submergent and emergent aquatic vegetation. Increased amounts of vegetation would improve water quality and provide nursery and escape cover for game fish species.
3. Continue to monitor fish population as changes in water levels positively or negatively effect game fish species.

STOCKING RECORD FOR LAKE ANDES, 1983 – PRESENT

Year	Species	Number	Size
1983	Bluegill	4000	Adult
1983	Largemouth Bass	34500	Fingerlings
1983	Northern Pike	750000	Fry
1984	Bluegill	218000	Fingerling
1984	Northern Pike	63	Adult
1984	Northern Pike	1000000	Fry
1984	Walleye	3500	Adult
1984	Yellow Perch	3500	Adult
1985	Black Crappie	50000	Fingerling
1985	Bluegill	400	Adult
1985	Bluegill	182000	Fingerling
1985	Northern Pike	1400000	Fry
1986	Northern Pike	1400	Adult
1987	Northern Pike	100000	Fingerling
1994	Northern Pike	60000	Fingerling
1995	Northern Pike	275	Adult
1995	Northern Pike	71400	Fingerling
1996	Yellow Perch	4820	Adult
1997	Northern Pike	100000	Fingerling
2001	Yellow Perch	800	Adult
2001	Northern Pike	2000000	Fry

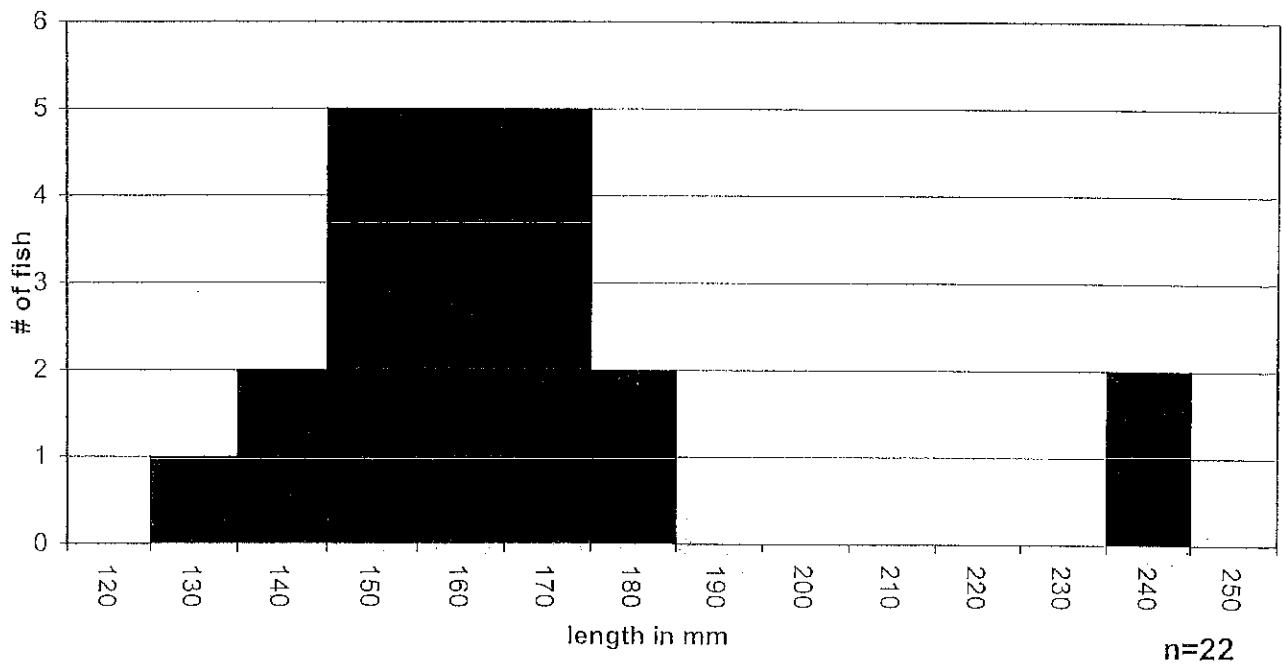
Lake Andes



Northern Pike

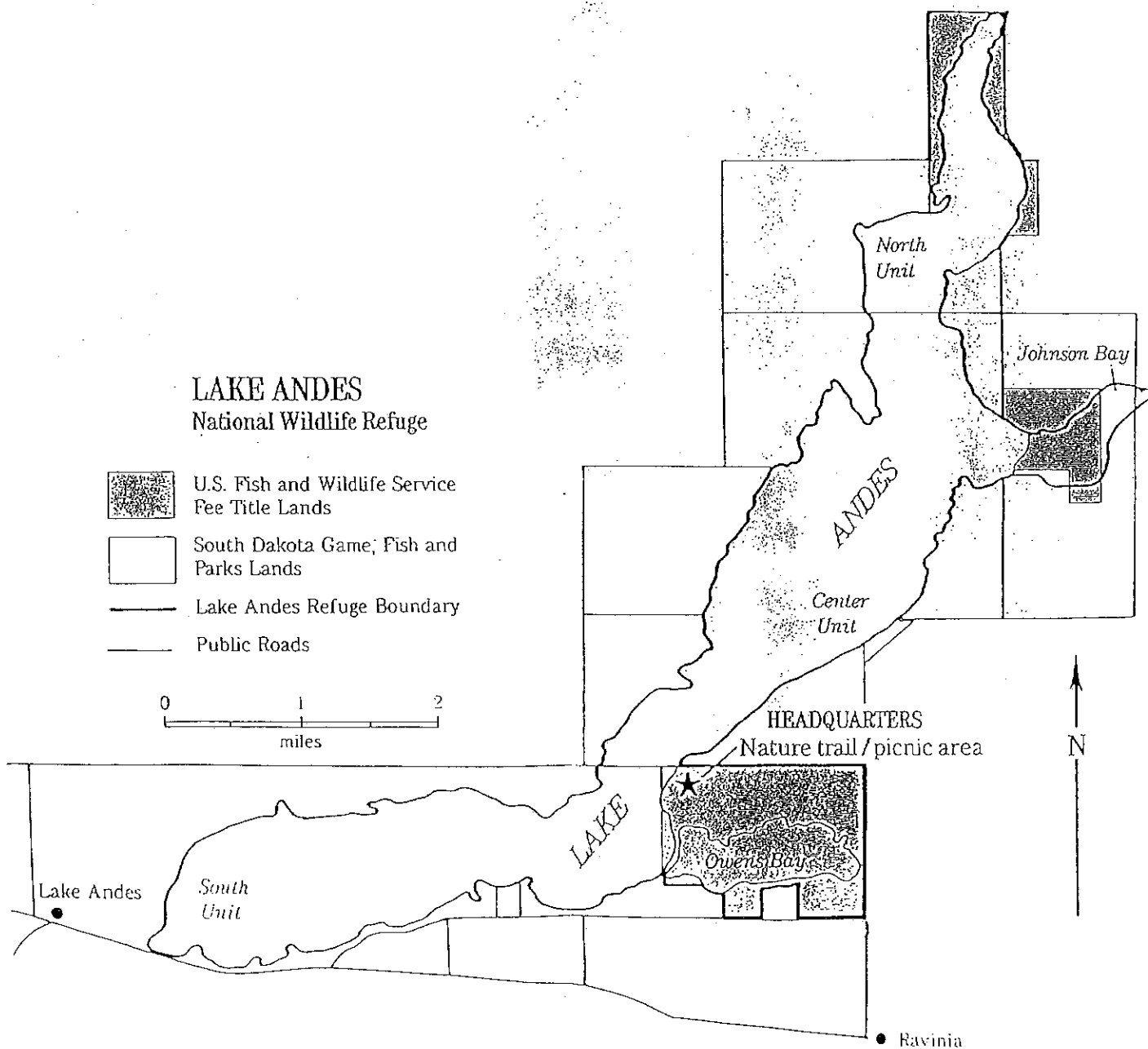
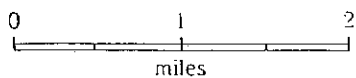


Yellow Perch



LAKE ANDES National Wildlife Refuge

-  U.S. Fish and Wildlife Service Fee Title Lands
-  South Dakota Game, Fish and Parks Lands
-  Lake Andes Refuge Boundary
-  Public Roads



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